

AMERICAN CROCODILES.

It is not generally known that in the less frequented parts of Florida we have a crocodile, and it is only within a few years that the discovery has been made, a single specimen attesting the fact in the collection of reptiles at the Smithsonian Institution. Probably seen before, but confounded with the alligators, as in Jamaica and South America, they are quite rare, and have never been captured until the fortunate find above mentioned.

Mr. Monroe informs me that during the past winter he had unusual opportunities of observing their habits, etc., and that to their resemblance to the alligator they owe their preservation. The great point of difference he found was, that the crocodiles lived in salt water bayous or creeks near the sea, while the alligators affected only the fresh water streams. Mr. Monroe's party observed some exceedingly large crocodiles at Key Biscayne—one the majority of the party claimed to be twenty feet in length; Mr. Monroe, however, thought it at least sixteen feet long. An attempt will be made to capture this one next winter, in the interest of science. The Indians are well acquainted with the crocodiles, and distinguish them as the "long-nosed alligators."

The crocodile, cayman, gavial, and alligator, are all types of the well known group (Crocodylia), and have some peculiarities that distinguish them at once from other reptiles. The heart resembles that of the birds more than that of any cold-blooded animals, in having the ventricle completely divided by a septum into two chambers; the venous and arterial blood joins outside of the heart; the brain is bird-like, the cerebellum broader; and naturalists divide them into two general orders: the true crocodiles and the alligators—the points of distinction being extremely conspicuous, especially in the shape of the head; the muzzle of the crocodile is much narrower behind the nostrils, that of the alligator being in a straight line. There are other anatomical differences needless to mention.

One of the largest of the order is the Gavial or Gangetic crocodile (*Gavialis gangeticus*), often reaching a length of twenty-five or thirty feet, and presenting a strange appearance with its attenuated muzzle, that, however, contains one hundred and twenty teeth.

The Nile crocodile (*Crocodylus vulgaris*) is nearly as large, and is now rarely seen in the lower Nile, if we except its mummies, which are extremely common in all the excavations.

Another species (*Crocodylus porosus*) is found in India, and easily recognized by the two long ridges extending from the front of the eye over the upper jaw. The Marsh crocodile (*Crocodylus palustris*) exceeds in size the Nile species, and in the British Museum there is a head of this species twenty-six inches in length, showing that the animal must have been thirty-three feet long. This species also occurs in Australia.

In Southern Africa is also found the margined crocodile (*Crocodylus marginatus*), that differs from the North African species by a curious concavity of the forehead and its stronger dorsal plate.

The Florida crocodile is the *Crocodylus acutus* of Cuvier, identical with the Jamaica species, but entirely different from the cayman of Guiana, South America. The Smithsonian specimen is a young one. Cobbold avers that the color of the adult is blackish brown above and yellowish white beneath; the upper parts of the legs and the sides varied with deep yellow, and in some parts tinged with green; in the younger ones the color on the upper parts is a mixture of brown and pale yellow, the under parts being nearly white. The eyes are provided with a nictitating membrane, or transparent movable pellicle, as in birds; the mouth is of a vast width, the *vicus* or gape having a somewhat flexuous outline, and both jaws being furnished with very numerous sharp-pointed teeth, of which those about the middle part of each jaw considerably exceed the rest in size, and seem analogous to the canine teeth in viviparous quadrupeds or mammalia. The tongue is attached by its entire marginal circumference to the lower jaw, and is not extensible, as in all true lizards; the ears are externally closed by two fleshy slips; the nostrils form a long narrow channel, which only open anteriorly at the back of the throat; and under the throat there are two small pouches, which secrete a strong musky substance. The tail is long, powerful, of a laterally compressed form, and furnished above with an upright process, formed by the gradual approximation of two elevated crests proceeding from the lower part of the back; it accordingly serves as the principal means of propelling the body through the water when in pursuit of fish. The legs are very short, but strong and muscular; the hind feet have only four toes, which are united toward their base by a strong web; the two interior toes on each of the forefeet, and the interior one on the hind feet, are destitute of claws.

Prof. Hill carefully examined a specimen of *Crocodylus acutus*, caught by him at Jamaica, and says: "On opening the jaws the attention is taken by the sight of a conspicuous cartilaginous plate before the gullet, forming a ridge from one side of the fauces to the other, and expanding upward to meet a similar elastic fold depending from the back of the palate. These are valves that shut in the throat. We are led to conclude, on first seeing these valves, that we are examining an animal that has no tongue, and that the underfold of what we are inspecting is the rudimentary trace of that animal cut out. This, however, with the corresponding curtain above it, in the roof of the mouth, forms an apparatus

that closes the distending aperture of the throat, and permits the reptile to hold its prey and drown it, without being itself liable to be drowned.

Between the branches of the lower jaw a certain degree of muscularity is perceived in the yellow flooring of the mouth. This is the representative of the tongue. The thickened membrane shows its lingual analogue, though destitute of all approach to a red color, by its rough glands and pores giving out saliva. The nostrils, placed at the extremity of the snout, terminate in a post-oral cavity, by passages that communicate with the throat behind the valvular apparatus we have been describing. This is a provision for respiration when the valves are closed, which at once renders intelligible and necessary a remarkable structure of the fauces by which the upper jaw seems to move upward, while the under one retains its horizontal position. The lower is prolonged behind the skull to a great depth. On raising the head at an angle the upper jaw appears to move upward, and the under jaw to remain immovable. The upper jaw does indeed move upward, but not independently. On casting back the head, an acetabulum of the united skull and jaw acts on a condyle of the lower maxillary bone, and lifts the whole head like the covered lid of a caddy; by this mechanism, the crocodile, on elevating its nostrils just barely out of the water, is able to breathe. With the body and head sunk below the surface, it keeps the under jaw pressed upward, and holds fast its drowning victim, its own breathing all the while being carried on with ease. The mouth is open, but the throat is shut, the gular valve being closed against all access of either air or water."

One of the interesting characteristics of the American crocodile is the care that it takes of its offspring; during the breeding season especially, the reptiles utter loud cries or shrieks that have been compared to the yelping of hounds or puppies. After the eggs have been buried by the female she frequently visits the nest, and when the young are about coming out she has been seen to move about the nest in clumsy tenderness, scratching and pawing the shells and uttering a curious barklike sound, that seems to excite the half hatched young to renewed exertions to extricate themselves from the broken eggs. This accomplished, she leads them away from the river to the marshy pools, safe from predatory visits of the male.

If hunted at this time they exhibit the utmost ferocity, and show great cunning in guiding their young to impervious swamps and places of safety. The young, who are unable to hunt for themselves, are fed by the mother, as are many of the young sea birds, by masticated food, disgorged for the purpose.

The movements of the crocodile on land, when in danger, are, according to Humboldt, Hill, and Gosse, totally different from those of the alligator, whose clumsy gait is familiar to all. They stand with their bodies off the ground, erect upon their legs, and make their attacks by successive jumps. That this method of attack is efficacious is shown by the experience of a priest, as related by Mr. Hill:

"The large savanna rivers in Spanish Hayti flow through wide but gently descending borders, carpeted with grass, and interspersed with thickets and clumps of flowering shrubs and forest trees. The grass has all the clean verdure of a lawn, and the clumps the variety and arrangement of ornamental shrubberies, and the earth is deep and loamy. These are favorite sporting grounds. Beside being verdant and beautiful, they are notoriously the game country. My friend and his companions had divided themselves, trusting to the crack of their fowling pieces to ascertain each other's whereabouts. When they had finished their day's sport the descending sun was already struggling through the lengthening shadows on the river. The friends assembled where they had parted in the morning, but the Spanish priest had not yet come in. No one had heard his gun from the time they had separated. They sought him through the darkening thickets, and along the stream, and found him at last, fast seated in a tree into which he had been obliged to betake himself to escape a crocodile that had pursued him by a succession of leaps. It had run in pursuit of him, as he said, jumping rapidly after him, with its back crooked like a frightened cat. He had sprung to the branches and gained their security out of the reach of the reptile, who, for a long time after he had got into the tree, couched in a thicket close by, where it quietly watched and waited his descent from his retreat."

The rapid growth of alligators, even in confinement, has often been watched with wonder, yet it would seem that the crocodile increases even at a more rapid rate, nearly a foot a year.

When Moreau de St. Mery, in 1790, collected materials for his work on San Domingo, he noticed a cayman that had been kept for ten years on a plantation at Gonaïves, not far from the Estir, called Cocherel. When it was first taken, it was only eighteen inches long; but at the time he wrote it had grown to the dimensions of seven feet. This may serve to give one some idea of the progressive growth of this reptile. He mentions that it was kept in a sort of inclosure into which no other water than that which the rain supplied was received; and rain does not commonly fall out of the season at Gonaïves. It was fed on the dead animals of the plantation and on sheep's entrails, but the people frequently neglected it; and it did not seem that in these intervals it got any food whatever, yet it steadily continued its growth. This notice of the penned-up reptile of Cocherel is most interesting for the fact of its living deprived of water.

There has been much controversy as to the manner of eating among these animals, and various opinions are held. Some consider that they take their food under water, devouring it only after it is putrid. General McChrystie, however, observed a species capture fish, toss them in the air, and catch them again, after the manner of the pelican. In the stomachs of Jamaica crocodiles, stones and marine crabs in great numbers were found, the former evidently taken in to aid digestion.

Great stress has been laid upon the fondness of the reptiles for dogs, and it has been found that a yelping puppy rarely failed to attract them, while the sportsman shot them from concealment. Hill, however, gives a different explanation to this: he thinks that owing to the similarity of the sounds, the females rush to the spot thinking their young are in danger, while the males are attracted by the hope of a feast upon their tender offspring. Waterton, the eminent naturalist and observer, has made the most extended observations upon the habits of the South American crocodiles. They were fished for by wire hooks formed of four pieces of hard wood a foot long, barbed at both ends; to these was affixed an animal of some kind, and with rope attached the bait was held over the river or pond, and if once taken, the struggles of the creature only served to hook it the more firmly. Waterton was probably the first to ride a cayman, and the following is his account of a capture novel in the extreme: "I placed all the people at the end of the rope, and ordered them to pull till the cayman appeared on the surface of the water; and then, should he plunge, to slacken the rope and let him go again into the deep. I now took the mast of the canoe in my hand (the sail being tied around the mast), and sank down upon one knee, about four yards from the water's edge, determining to thrust it down his throat, in case he gave me an opportunity; I certainly felt somewhat uncomfortable in this situation, and I thought of Cerberus on the other side of the Styx ferry. The people pulled the cayman to the surface; he plunged furiously as soon as he arrived in these upper regions, and immediately went below again on their slackening the rope. I saw enough not to fall in love at first sight. I now told them we would run all risks, and have him on land immediately. They pulled again, and out he came—'monstrum, horrendum, informe.' This was an interesting moment. I kept my position firmly, with my eye fixed steadfast on him.

"By this time the cayman was within two yards of me. I saw he was in a state of fear and perturbation; I instantly dropped the mast, sprang up, and jumped on his back, turning half round as I vaulted, so that I gained my seat with my face in a right position. I immediately seized his fore legs, and, by main force, twisted them on his back, thus they served me for a bridle. He now seemed to have recovered from his surprise, and probably fancying himself in hostile company, he began to plunge furiously, and lashed the sand with his long and powerful tail. I was out of reach of the strokes of it by being near his head. He continued to plunge and strike, and made my seat very uncomfortable. It must have been a fine sight for an unoccupied spectator. The people roared out in triumph, and were so vociferous that it was some time before they heard me tell them to pull me and my beast of burden further inland. I was apprehensive the rope might break, and then there would have been every chance of going down to the regions under water with the cayman. The people now dragged us above forty yards on the sand; it was the first and last time I was ever on a cayman's back.

"After repeated attempts to regain his liberty, the cayman gave in and became tranquil through exhaustion. I now managed to tie up his jaws, and firmly secured his fore feet in the position I had held them. We had now another severe struggle for superiority, but he was soon overcome and again remained quiet. While some of the people were pressing upon his head and shoulders, I threw myself on his tail, and by keeping it down in the sand, prevented him from kicking up another dust. He was finally conveyed to the canoe, and then to the place where we had suspended our hammocks. There I cut his throat, and, after breakfast was over, commenced the dissection."

The crocodile of the American continent is far from being as savage as those of the Old World, yet numbers of instances are known where their attacks have resulted in the loss of life.

Prairie Dog Skins for Gloves.

In a recent communication Mr. Courtney Graham, of Colorado City, Texas, suggests that some enterprising tanner undertake the preparation of prairie dog skins for glove leather. The animals are exceedingly abundant in those parts, as they are almost everywhere on the plains and further west. In many places they are a serious nuisance, the grass of the cattle ranges being eaten up by them, and the ground honeycombed with their holes. They might be caught in large numbers, and would be caught by boys and others, if a market were made for their pelts.

It would be interesting to know if any attempt has been made to tan the skins of these animals or to use their hair or fur in the arts. The small size of the "dogs"—really rodents, like woodchucks and ground squirrels—would seem to be the chief bar to the profitable handling of their pelts.

THE search for pearls in the mussels of Ohio has been a considerable industry for years.

Insects on the Surface of Oranges.

When a dish of oranges is seen on the table for dessert, the fact is hardly realized that in all probability their surface is the habitat of an insect of the *Coccus* family. This tiny creature is found on the orange skin in every stage of transformation, from the egg to the perfect insect, during the winter months, instead of remaining dormant in the cold weather, as is the case with most of the insect tribe. It would hardly be possible to find a St. Michael's or Tangerine orange that had not hundreds of these little creatures in various stages of development on their surface. Lemons, too, are frequently covered. Upon inspection, the skin of an orange will be found to be dotted over with brownish scarlet spots of various sizes. These specks can be easily removed by a needle; and when placed under a microscope, an interesting scene is presented, consisting of a large number of eggs, which are oval white bodies, standing on end, like little bags of flour, some of the inhabitants of which may very probably be seen in process of emerging from the opened end of the egg. The female insect upon leaving the egg has six legs, two long hair-like appendages, and no wings; it thrusts a sucker into the orange in order to obtain nourishment, and never moves again, passing through the various stages of development until it lays its eggs and dies. In the case of the male insect, the chrysalis after a short period opens and the insect flies off. The male is supplied with wings twice the length of its body, and each of the legs has a hook-like projection. It has four eyes and two antennæ, and is so tiny that it cannot be seen when flying.

From some parts of Spain, oranges come to us having their rind covered with a *coccus* of quite a different type. The surface of oranges, indeed, affords the possessor of a microscope an infinite amount of interest and amusement.—*Chambers' Journal*.

NEW FERTILIZER DISTRIBUTER.

It is said that "the manure pile is the farmer's bank." It is certain that upon it depend his crops and his success in farming. No farmer has manure enough; he can always find use for more than he has. It is therefore of first necessity that he shall employ it to the best advantage and get all the good there is in it.

The best authorities agree in saying that the more thoroughly manure is comminuted and the more evenly it is distributed over the entire surface of the soil, the more effective will it be in producing a rapid growth and a large crop. And it is certain that the more thoroughly the manure and soil are intermingled the greater will be the economy in the use of manure.

We give an engraving of the Kemp manure spreader, a machine that effects the thorough distribution of fertilizers. It is made by the Kemp & Burpee Manufacturing Company, of Syracuse, N. Y. The working parts of this machine are mounted on a substantial cart, capable of containing thirty bushels, or about one-third of a cord, and can be attached to the fore wheels of any ordinary farm wagon. The floor of the cart is a revolving apron, which is carried backward by the gearing, bringing its contents against a rapidly revolving beater, which breaks up the manure finely and distributes it.

It is thrown into gear by a single lever at the left hand of the driver's seat, and throws itself out of gear when the load is spent. In running to and from the field none of the machinery is in motion, and it may be used the season through the same as an ordinary cart, and it needs no special adjustment for different kinds of work. It will thoroughly and evenly spread all kinds of manure found on the farm, from the coarsest down to the finest, including ashes and lime, in all conditions, wet or dry. The time required to spread a load is from one and a half to two minutes, without manual labor.

It can be regulated to spread different quantities of manure to the acre. The farmer may know just how much manure he is using without the trouble of measuring his field and his manure pile. We are informed that the spreader has been in use for three seasons, and there are now a large number of them in the hands of the best farmers in the country, who speak of it in the highest terms.

Definition of "Innocent Purchasers."

"Innocent purchasers," literally translated, signifies willfully ignorant purchasers. People who purchase from irresponsible parties, or from total strangers, have no right to complain if they are victimized, and as a general thing it is only the class who expect to make two dollars' worth from an investment of fifty cents who are victimized. The man who, in playing a "skin game," comes out "peeled," is not entitled to protection; he accepts his chances and should abide by the result.—*Milling World*.

ONE THOUSAND CARS ORDERED.—The Indianapolis Car Works have commenced on the contract to build 1,000 cars for the New York, Chicago & St. Louis road. The car is 30 feet long, and has a carrying capacity of 40,000 pounds,

NOVEL BOOT SUPPORTER.

One of the boots shown in the annexed engraving has Reed's recently patented supporter applied to it; the other is of ordinary make, and both have been subjected to the same wear under the same conditions, with vastly different results, as will be seen by the engraving.

The improvement consists in a finely tempered and very flexible spring wire inserted in a pocket formed by a double seam or welt in the sides of the boot leg. These welts may be either inside or outside of the leg.

The steel springs, while they allow perfect freedom of motion of the leg and ankle, keep the bootleg from wrinkling down and prevent the counter from running over.

This improvement adds very little to the expense of the boot, while it greatly increases its value to the consumer. It may be applied to either fine or coarse boots, and will increase their durability. It gives ease and comfort to the wearer and prevent galled feet and ankles.

**REED'S BOOT SUPPORTER.**

Further information may be obtained by addressing Messrs. Reed & Simons, Williamston, Mich.

Vibrations Produced by Railway Trains.

Prof. H. M. Paul has communicated to the Seismological Society of Japan some notes on the effect of railway trains in transmitting vibrations through the ground. A box holding about twenty pounds of mercury, thickened by amalgamation with tin, was placed upon a heavy plank screwed to the top of a post sunk $4\frac{1}{2}$ feet into the ground. Images reflected in the surface of the mercury were observed by a telescope, as in meridian observations. An express train, passing at a distance of one-third of a mile, set the surface of the mercury in confused vibration for two or three minutes. Other observations were made at stations at somewhat greater distances. The experimenter also found that

**KEMP'S FERTILIZER DISTRIBUTER.**

a one-horse vehicle passing along a graveled road 400 or 500 feet distant caused a temporary agitation of the mercury whenever the wheels struck a small stone.

TREATMENT OF PNEUMONIA BY THE INHALATION OF ETHER.—Dr. Samuel W. Francis, Newport, R. I., reports the successful treatment of an acute case of pneumonia by the inhalation of sulphuric ether. He says that "if seen early, during the first stage, by inhaling ether for thirty minutes, every six hours, many severe and protracted cases of sickness would be arrested." Dr. Francis recommended inhalation of sulphuric ether for bronchitis in 1868.

Cochineal.

Cochineal, as found in trade, is the dried body of the female cochineal insect, which lives on a species of cactus. During life it is about the size of a small ladybug. It is rather long, compressed, equally broad all over, wingless, and marked behind with deep incisions and wrinkles. The cochineal insect has six feet, which nevertheless are only of use directly after birth. It fastens itself upon the plant by means of a trunk placed between the forefeet, and remains there till it dies. The sap of the plant provides this little animal with nourishment. The male cochineal insects resemble the female only during the larva state. They change into the chrysalis, and soon come forth as small red flies. The female then lays some thousands of eggs, and becomes covered with a white powder. She protects the eggs under her body, and hatches them, so to speak, in this way. When the young insect appears the mother dies. The young are now in the larva state, and the sex cannot be discerned. They lose their skin several times, and the female then fixes herself on the plant. The males, after passing through the pupa state, are winged. Their whole period of life is from two to three months. The cochineal insects are gathered shortly before they lay eggs, and they are then very rich in coloring matter. Only sufficient eggs are laid as may serve to reproduce the insect. The dead females are also collected. They are killed with hot water or steam, and dried in the sun, in ovens, or on plates. They have a brown, red, white, or black color, and lose in the drying two-thirds of their weight. After drying the cochineal is sieved. About 70,000 insects go to make a pound of cochineal.

The Medicinal Value of Vegetables.

A celebrated cook book discusses the medicinal value of vegetables, as follows:

"Asparagus is a strong diuretic, and forms part of the cure for rheumatic patients at such health resorts as Aix-les-Bains. Sorrel is cooling, and forms the staple of that *soupe aux herbes* which a French lady will order for herself after a long and tiring journey. Carrots, as containing a quantity of sugar, are avoided by some people, while others complain of them as indigestible. With regard to the latter accusation, it may be remarked, in passing, that it is the yellow core of the carrot that is difficult of digestion—the outer, a red layer, is tender enough. In Savoy, the peasants have recourse to an infusion of carrots as a specific for jaundice.

"The large, sweet onion is very rich in those alkaline elements which counteract the poison of rheumatic gout. If slowly stewed in weak broth, and eaten with a little Nepal pepper, it will be found to be an admirable article of diet for patients of studious and sedentary habits. The stalks of cauliflower have the same sort of value, only too often the stalk of a cauliflower is so ill-boiled and unpalatable that few persons would thank you for proposing to them to make part of their meal consist of so uninviting an article. Turnips, in the same way, are often thought to be indigestible, and better suited for cows and sheep than for delicate people; but here the fault lies with the cook quite as much as with the root. The cook boils the turnip badly, and then pours some butter over it, and the eater of such a dish is sure to be the worst for it. Try a better way. What shall be said about our lettuces? The plant has a slight narcotic action, of which a French old woman, like a French doctor, well knows the value, and when properly cooked it is really very easy of digestion."—*Medical Record*.

Sound Boots.

Viscount Cranbrook recently narrated a telling anecdote when distributing some science prizes to workmen. He begged the medalists and prize winners not to be puffed up with their own importance, because they had answered certain questions in chemistry and physics without a mistake. It was most gratifying to know that they, as hardworking handicraftsmen, were well grounded in science; but, for all that, they were not yet chemists. An old cobbler of the Viscount's acquaintance was exceedingly proficient in the subjects taught at science classes; he knew pretty well every star in the heavens by name, his knowledge of inorganic chemistry was profound, and he was one of the best draughtsmen in the village. But, after all, his great pride was to make a sound pair of boots.

Large Lathes.

The South Boston Iron Works have nearly completed for their own use two 90-foot lathes, which are thought to be the largest and heaviest lathes in the world.

The lathes are made in six sections of 30 feet each. The head stocks and face plates weigh 10 tons each, and each bed section 10 tons. The completed lathes will each contain 600,000 pounds of iron. They are built specially for boring out cannon, but are adapted for all heavy work.